

Project Title:       **Staging, Storage, Sizing and Treatment Facility (SSSTF)**  
Document Type:     **Technical Specifications**                      Project Number:  
Revision Number:    0

1    **SECTION 10500--METAL LOCKERS**

2  
3    **PART 1--GENERAL**

4  
5    **SUMMARY:**

6  
7    Extent of metal lockers is shown on drawings.

8  
9    **Section Includes:** Work includes, but is not limited to:

10  
11        Furnish and install single-tier metal lockers.

12  
13    **SUBMITTALS:**

14  
15    Submittals include, but are not limited to the following:

16  
17    **Product Data:** Submit product data including manufacturer's installation instructions.

18  
19    **Samples:** Submit manufacturer's standard color chips for selection by the Contractor.

20  
21    See Section 01300, Submittals and the Vendor Data Schedule for additional submittal  
22    requirements.

23  
24    **QUALITY CONTROL:**

25  
26    **Single Source Responsibility:** Provide each type of metal locker as produced by a single  
27    manufacturer, including necessary mounting accessories, fittings, and fastenings.

28  
29    **PART 2--PRODUCTS**

30  
31    **MANUFACTURER:**

32  
33    Subject to compliance with requirements, provide products by one of the following

34  
35        Lyon Metal Products, Inc.

36        Penco Products, Inc.

37        Republic Steel Corp.

38  
39    **MATERIALS:**

40  
41    **Sheet Steel:** Mild cold-rolled and leveled steel, free from buckle, scale, and surface  
42    imperfections.

43    **Fasteners:** Cadmium, zinc, or nickel plated steel; exposed bolt heads, slotless type; self-  
44    locking nuts or locker washers for nuts on moving parts.

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1    Accessories: Hooks and hand rods of cadmium-plated steel or cast aluminum.

2  
3    FABRICATION:-

4  
5    Fabricate lockers square, rigid, and without warp, with metal faces flat and free of dents or  
6    distortion.

7  
8    LOCKERS:

9  
10   Lockers shall be 18 in. wide x 21 in. deep x 72 in. high with a metal base.

11  
12   Frame: Fabricate of 16-gage channels or 12-gage angles, minimum, with continuous  
13   stop/strike formed on vertical members.

14  
15   Body: Fabricate back and sides of 24-gage minimum steel, with double-flanged connections  
16   extending full height. Form top and bottom of not less than 24-gage steel, with flanged  
17   edges.

18  
19   Provide 24-gage steel sheet hat shelf in single-tier units.

20  
21   Form exposed ends of non-recessed lockers of 16-gage minimum steel.

22  
23   Door: One-piece, 16-gage minimum sheet steel, flanged at all edges, constructed to prevent  
24   springing when opening or closing. Fabricate to swing 180° unless otherwise indicated.

25  
26       Reinforcing: Provide extra bracing or reinforcing on inside of doors over 15 in. wide.

27       Ventilation: Provide stamped, louvered vents in door face, as follows:

28       Single-Tier Lockers: Not less than 6 louver openings top and bottom.

29  
30       Hinges: Heavy-duty, not less than 0.050 in. thick steel, full-loop, 5-knuckle, tight pin,  
31       2 in. high. Weld to inside of frame and secure to door with not less than 2 factory-  
32       installed fasteners which are completely concealed and tamperproof when door is  
33       closed.

34  
35       Provide at least 3 hinges for each door 42 in. high and over, at least 3 hinges for each  
36       door less than 42 in. high.

37  
38       Latching: Positive automatic, prelocking, dry-resistant latch and pull with rubber  
39       silencers; chromium-plated, heavy-duty, vandalproof lift-up handle, containing strike  
40       and eye for padlock; and with not less than 3-point latching for single tier lockers.

41  
42   Locking: Fabricate lockers to receive padlocks provided by the Contractor.

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1   Finish: Apply baked-on enamel finish to all surfaces, exposed and concealed, except plates  
2   and non-ferrous metal.

3  
4   Color: Provide locker units in color as selected by Contractor from manufacturer's standards.  
5   Unless otherwise indicated, concealed parts may be manufacturer's standard neutral color.

6  
7   ACCESSORIES:

8  
9   Furnish each locker with the following items, unless otherwise shown:

10  
11   Hat Shelf: One double-prong ceiling hook and not less than 2 single-prong wall hooks.

12  
13   Number Plates: Manufacturer's standard etched, embossed, or stamped, non-ferrous metal  
14   number plates with numerals not less than 3/8 in. high. Number lockers in sequence. Attach  
15   plates to each locker door, near top, centered, with at least 2 fasteners of same finish as  
16   number plate.

17  
18   Metal Base: Minimum 20-gage cold-rolled steel, fabricated in lengths as long as practicable  
19   to enclose base of lockers without additional fastening devices. Flange bottoms inward  
20   3/4 in. for stiffening. Factory-finish metal base to match lockers.

21  
22   Separators: Provide manufacturer's standard vertical dividers of sheet steel.

23  
24   Sloped Tops: Provide manufacturer's standard sloped tops of 18 ga. sheet steel in finish and  
25   color to match lockers.

26  
27   End and Back Panels: Provide manufacturer's standard end and back panels in 16 ga. sheet  
28   steel, match color and finish of lockers. These panels shall be provided where ends or backs  
29   of lockers are exposed.

30  
31   PART 3--EXECUTION

32  
33   INSTALLATION:

34  
35   Erect stalls straight, plumb and level, securely anchored and rigid. Lay out work and cut or  
36   drill into other finishes accurately. Errors or poor workmanship which causes damage to  
37   adjacent materials or finishes shall be corrected as directed by the Construction Engineer.

38  
39   Wall Attachment: Space fasteners about 48 in. o.c., unless otherwise recommended by  
40   manufacturer, and apply through backup reinforcing plates where necessary to avoid metal  
41   distortion; conceal fasteners insofar as possible.

42  
43   Base: Install metal locker base using concealed fasteners to provide flush, hairline joints  
44   against adjacent surfaces.

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1   Benches: Install benches to comply with manufacturer's instructions.

2  
3   FIELD QUALITY CONTROL:

4  
5   Surveillance will be performed by the Contractor's Representative to verify compliance of the  
6   work to the drawings and specifications.

7  
8   ADJUST AND CLEAN:

9  
10   Adjust: Adjust doors and latches to operate easily without binding. Verify that integral  
11   locking devices are operating properly.

12  
13   Touch-Up Marred Finishes: Touch-up marred finishes, but replace units which cannot be  
14   restored to factory-finished appearance. Use only materials and procedures recommended or  
15   furnished by locker manufacturer.

16  
17   END OF SECTION 10500

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1 SECTION 10800--TOILET ACCESSORIES

2  
3 PART 1--GENERAL

4  
5 SUMMARY:

6  
7 Toilet accessories required are shown on drawings and schedules.

8  
9 Section Includes: Work includes, but is not limited to furnish and install:

10 Paper towel dispensers  
11 Waste receptacles  
12 Sanitary napkin dispensers  
13 Sanitary napkin disposal units  
14 Toilet tissue dispensers  
15 Grab bars  
16 Soap dispensers  
17 Seat cover dispensers  
18

19 SUBMITTALS:

20  
21 No submittals required unless an "or equal" item is proposed.  
22

23 QUALITY CONTROL:

24  
25 Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete  
26 or built into masonry. Coordinate delivery with other work to avoid delay.  
27

28 Accessory Locations: Coordinate accessory locations with other work to avoid interference  
29 and to assure proper operation and servicing of accessory units.  
30

31 PART 2--PRODUCTS

32  
33 MANUFACTURER:

34  
35 Subject to compliance with requirements, provide products from one of the following:

36  
37 American Specialties, Inc.  
38 Basco  
39 Bobrick Washroom Equipment, Inc.  
40 Bradley Corp.  
41 Gamco  
42 Scott  
43  
44

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1    ACCESSORIES:

2  
3    Furnish each item complete with screws, bolts, clips, and other accessory parts as required for  
4    proper installation, operation and appearance.

5  
6    All accessories shall be as specified on drawings, or approved equal.

7  
8    PART 3--EXECUTION

9  
10   INSTALLATION:

11  
12   Securely attach each accessory level and plumb. Flanges of recessed items shall be in neat  
13   uniform contact with wall surfaces along full length. Assure that finish is carried evenly to  
14   each installation. Assure that there are no open joints between finish and fixture. Filling of  
15   open spaces is prohibited. Repair or conceal open spaces as directed by the Construction  
16   Engineer. In general, attach to drywall with toggle bolts except where blocking has been  
17   provided. Attach into stud blocking with sheet metal steel screws.

18  
19   FIELD QUALITY CONTROL:

20  
21   Surveillance will be performed by the Contractor's Representative to verify compliance of the  
22   work to the drawings and specifications.

23  
24   END OF SECTION 10800  
25

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1    SECTION 12390—CABINETS AND PLASTIC LAMINATE

2  
3    PART 1—GENERAL

4  
5    DESCRIPTION OF WORK

6  
7    The work includes plastic laminate covered cabinets where indicated on drawings (kitchen,  
8    storage room, and conference rooms) and window sills, cabinets, hinges, drawer slides, pulls,  
9    locks and associated accessories.

10  
11   Sink units in countertops are specified in a Division 15 section.

12  
13   SUBMITTALS:

14  
15   Shop Drawings: Submit drawings showing location and size of each type of cabinet, window  
16   stools and countertops, accessories, materials, finishes, hardware types and locations, fillers,  
17   etc. Include fully dimensioned plans and elevations and indicate details and anchorage to  
18   countertop and to walls.

19  
20   PRODUCT DELIVERY, STORAGE AND HANDLING:

21  
22   Protect wood cabinets and countertops during transit, delivery, storage and handling to  
23   prevent damage, soiling and deterioration.

24  
25   VENDOR DATA: See Vendor Data Schedule.

26  
27   PART 2—PRODUCTS

28  
29   DEFINITIONS:

30  
31   Exposed portions of cabinets and window stools include all surfaces including edges visible  
32   when doors and drawers are closed.

33  
34   Semi-exposed portions of cabinets include surfaces behind opaque doors and drawer fronts  
35   including shelves, dividers, interior faces of cabinet ends, backs, tops and bottoms, drawer  
36   side backs and bottoms, and back face of doors.

37  
38   Concealed portions of cabinets include sleepers, web frames, dust panels and other surfaces  
39   not normally visible at installation.

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**BASIC MATERIALS:**

## PLATIC LAMINATE CABINETS

**Exposed Surfacing Material of Doors, Drawer Fronts, Fixed Panels, Toeboards.**

**Ends:** High pressure plastic laminate, 0.028 in, thick, General Purpose Type (GP-28). Color shown in color schedule of these specifications.

Counter Top: High pressure plastic laminate 1/16 in. thick. Color to match front and sides.

Semi-Exposed Surfacing Material and Doors: High pressure plastic laminate, 0.020 in, thick, Cabinet Liner Type (CL-20), in white color.

**Remaining Semi-Exposed Materials:** Decorative boards, General Purpose Type, conforming to NEMA LQ-1 with decorative face patterns or colors and finish indicated, or, if not indicated, selected by Architect from manufacturer's standard choices. Submit samples to the Construction Engineer.

**Concealed Materials:** Any sound, dry solid lumber, plywood or particleboard or combination thereof; without defects affecting strength, utility or stability. On concealed surfaces or portions constructed of decorative boards, provide decorative or cabinet liner back (Light Duty Tape).

### Core Material for Plastic Laminates: Particleboard.

**Treatment of Exposed and Semi-Exposed Edges:** Edge doors and drawer fronts with plastic laminate of same material as exposed faces. Edge top of drawer body with high impact plastic tee edging. Edge remaining portions of cabinets with high pressure plastic laminate not less than 0.028 in. thick matching adjoining plastic laminate in colors or patterns and finish, unless otherwise indicated.

**Style of Face Construction:**

**Flush Overlay Style:** Provide base, wall and full height units (if any), with drawer fronts, doors and fixed panels (if any) overlaying and concealing face frames of cabinet body, unless otherwise indicated.

### Cabinet Construction:

Sides, Dividers, Tops, Bottoms, Shelves and Stretchers: Not less than 3/4 in. thick. Provide stretchers at top of base cabinet.

**Backs:** Not less than 3/8 in. thick.



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1 Drawers: Sides, subfronts and backs: not less than ½ in. thick bottoms: not less than 3/8 in.  
2 thick. Provide box type construction with front, bottom and back rabbeted in sides and  
3 secured with glue and mechanical fasteners.

4  
5 Joinery: Rabbet backs and set flush into end panels and secure with concealed mechanical  
6 fasteners. Connect base cabinet bottoms and stretchers to ends and dividers by means of  
7 mechanical fasteners. Set tops, bottoms and backs flush with sides.

8  
9 Subbase: Not less than ¾ in. thick, of height and in relationship to cabinet fronts and  
10 exposed ends as indicated.

11  
12 Toeboard: Not less than 5/8 in. thick, attached to subbase with concealed fasteners.

13  
14 Substrate (Core) for Exposed Surfacing Material: Particle board.

15  
16 CABINET HARDWARE:

17  
18 General: Provide manufacturer's standard hardware units complying with ANSI A156.9, of  
19 type, material, size and finish as selected by Design Architect from manufacturer's standard  
20 choices.

21  
22 PART 3—EXECUTION

23  
24 INSTALLATION

25  
26 Anchor cabinets securely in place with concealed (when doors and drawers are closed)  
27 fasteners, anchored into structural support members of wall construction.

28  
29 Attach countertops securely to base units. Splice and glue joints in countertops; provide  
30 concealed mechanical clamping of joint. Provide cutouts for fixtures and appliances as  
31 indicated.

32  
33 Complete hardware installation and adjust door and drawer for proper operation.

34  
35 CLEANING AND PROTECTION:

36  
37 Repair or remove and replace defective work as directed upon completion of installation.

38  
39 Clean exposed and semi-exposed surfaces, touch-up as required and removed and refinished  
40 damaged or soiled areas.

41  
42 Protection: Installer shall advise Subcontractor of final protection and maintained conditions  
43 necessary to ensure that work is without damage or deterioration at time of acceptance.  
44

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1 END OF SECTION 12390

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1    SECTION 12512—HORIZONTAL LOUVER BLINDS

2  
3    PART 1—GENERAL

4  
5    WORK DESCRIPTION:

6  
7    SYSTEM DESCRIPTION:

8  
9    Blinds specified are “mini blinds” with a stick operator on one side controlling slat tilt and a  
10 pull cord on the other for raising the entire blind.

11  
12 WORK INCLUDED: Work includes, but is not limited to:

13  
14       Provide and install Horizontal Louver Blinds for all windows.

15  
16 SUBMITTALS:

17  
18 See Vendor Data Schedule.

19  
20 DELIVERY, STORAGE, AND HANDLING:

21  
22 Deliver blinds to site in unopened boxes and store in an area protected from moisture and  
23 physical damage.

24  
25 WARRANTY:

26  
27 Warrant blinds for one year after facility transfer date to be free of defects in manufacturer or  
28 installation.

29  
30 PART 2—PRODUCTS

31  
32 MATERIALS:

33  
34 Blinds shall be the “Riveria” blind with 1 in. slats, as manufactured by Levolor or approved  
35 equal. Color shall be selected by the Design Architect, submit samples to the contractor.  
36 Provide a valance of the same color as the slats to cover the front of the head.

37  
38 PART 3—EXECUTION

39  
40 INSTALLATION/APPLICATION/ERECTION:

41  
42 Install as per standard industry practices.  
43  
44



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1    SECTION 13120--METAL BUILDING SYSTEMS

2  
3    PART 1--GENERAL

4  
5    SUMMARY:

6  
7    The Subcontractor shall furnish and install a metal building system, complete, as shown on  
8    the subcontract drawings and as specified herein.

9  
10   Section Includes: Work includes, but is not limited to:

11  
12        Design, fabrication, and erection of metal building system with symmetrical roof  
13        peak, parallel flange columns (straight), eave height and roof slope as indicated on the  
14        drawings,

15  
16        Installation of metal roof, exterior walls and liner panel with flashings,

17  
18        Installation of canopies at all man doors,

19  
20        Structural accommodations for metal deck at mezzanine,

21  
22        Structural bracing and support where stack penetrates roof as indicated on the  
23        drawings

24  
25        Installation of all necessary trim, accessories, flashings at all penetrations to insure  
26        weathertightness.

27  
28   REFERENCES:

29  
30    The following Codes and Standards, including others referenced therein, form a part of this  
31    Section to the extent specified herein:

32  
33                      AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

34  
35            AISC (ASD)      Specification for Structural Steel for Buildings – Allowable Stress  
36                                  Design (ASD)

37  
38    AMERICAN IRON AND STEEL INSTITUTE (AISI)

39  
40            AISI              Specification for the Design of Cold-Formed Steel Structural Members

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1 AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

2  
3 ASTM A 36 Standard Specification for Carbon Structural Steel  
4 ASTM A 53 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-  
5 Coated, Welded and Seamless  
6 ASTM A 325 Standard Specification for Structural Bolts, Steel, Heat-Treated,  
7 120/105 ksi Minimum Tensile Strength  
8 ASTM A 500 Standard Specification for Cold-Formed Welded and Seamless Carbon  
9 Steel Structural Tubing in Rounds and Shapes  
10 ASTM A 501 Standard Specification for Hot-Formed Welded and Seamless Carbon  
11 Steel Structural Tubing.  
12 ASTM A 529 Standard Specification for High-Strength Carbon-Manganese Steel of  
13 Structural Quality  
14 ASTM A 570 Standard Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled,  
15 Structural Quality  
16 ASTM A 572 Standard Specification for High-Strength, Low-Alloy Columbium-  
17 Vanadium Structural Steel  
18 ASTM A607 Standard Specification for Steel, Sheet and Strip, High-Strength, Low-  
19 Alloy, Columbium or Vanadium, or Both, Hot-Rolled, and Cold-  
20 Rolled  
21 ASTM A 755 Standard Specification for Steel Sheet, Metallic Coated by the Hot-  
22 Dipped Process and Pre-Painted by the Coil-Coating Process for  
23 Exterior Building Products

24  
25 METAL BUILDING MANUFACTURERS ASSOCIATION (MBMA)

26  
27 MBMA Recommended Design Practices Manual  
28 MBMA Metal Building Systems Manual

29  
30 INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO)

31  
32 UBC Uniform Building Code  
33

34 **SUBMITTALS:**

35  
36 Submittals shall be as follows:

37  
38 **Certifications:** Submit, for the proposed building system, proof of affiliation to Metal  
39 Building Manufacturers Association (MBMA), and proof of certification under the AISC  
40 Metal Building Systems (MB) Certification Program. Metal building erector shall be  
41 approved by the Metal Building System Manufacturer as required to provide a fully  
42 warranted system.  
43

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1    Design Calculations: Submit design calculations showing all loads specified. Design  
2    calculations shall include but not be limited to structural steel members and anchor bolts. All  
3    calculations shall be stamped by a Professional Engineer registered in the State of Idaho to  
4    practice civil or structural engineering.

5  
6    Shop Drawings: Submit shop drawings on the metal building system completely detailing all  
7    major trusses (if any), rigid frames, purlin/girt locations, columns, wall panels, roof panels,  
8    doors, base plates, anchor bolts, anchor bolt locations, portal frame locations and/or cross  
9    bracing locations, rain gutters, downspouts, flashings and wall base conditions, and any other  
10   graphic information required to evaluate the complete structure including all dimensions.  
11   Unique structural supports as noted on the drawings shall also be included in the required  
12   shop drawing submittals.

13  
14   Subcontractor shall be responsible for all adjustments required to plans as a consequence of  
15   the proposed building manufacturer. Specifically, the pier dimensions for the building  
16   foundations shall be adjusted if required to accommodate the supplied metal buildings base  
17   plates.

18  
19   All calculations and shop drawings shall be submitted for approval prior to shipment and  
20   installation.

21  
22   Warranties: Submit warranties for approval prior to bid award. Submit executed warranties  
23   before final acceptance of the project.

24  
25   Certification: Submit certification that panels and accessories have been installed in  
26   accordance with the manufacturer's specifications.

27  
28   See Section 01300, "Submittals" and Vendor Data Schedule for Submittal requirements.

29  
30   QUALITY CONTROL:

31  
32   Regulatory Requirements (Codes and Standards): Comply with provisions of the following  
33   codes and standards, unless otherwise specified (see Part 2 - "Design Loads" for additional  
34   load criteria):

35  
36       Structural Steel:

37  
38       AISC (ASD)

39  
40       Primary and Secondary Members:

41  
42       MBMA       Recommended Design Practices Manual, for applicable loads and load  
43       combinations

44       MBMA       Metal Building Systems Manual, for collateral loads



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1 UBC Wind, Snow, and Seismic loads

2  
3 Qualifications: Provide prefabricated metal building system as produced by a manufacturer  
4 who is regularly engaged in fabrication of pre-engineered metal structures of type and quality  
5 indicated. All components shall be provided from one manufacturer.  
6 The manufacturer shall be certified under the Metal Building systems (MB) Certification  
7 Program, AISC FCD.  
8

9 WARRANTIES:

10  
11 Materials: The roofing and siding shall be warranted for a minimum of 20 years against  
12 leakage, paint fade, chipping, peeling, attachment and rusting. Warranty shall include labor  
13 and materials for replacement of the effected items. Warranty shall not be pro-rated over a  
14 20 year period.  
15

16 Workmanship (Assembly): The roof and wall assemblies and any associated flashing of  
17 assemblies shall be warranted for a minimum of five (5) years against wind damage, leakage,  
18 and material deterioration resulting from assemblage of building components. Warranty shall  
19 include replacement/repair of effected items and labor to accomplish such.  
20

21 PART 2--PRODUCTS

22  
23 MANUFACTURER:

24  
25 Design details, dimensions, and sizes are representative only. All dimensions and clearances  
26 shall be taken as minimums for evaluation of submittal. Subcontractor shall be responsible  
27 for all adjustments required to plans as a consequence of differing building dimensions.  
28 Subcontractor shall provide calculations on footing pier sizes, and sizes and number of  
29 anchor bolts required to develop building reactions. All calculations, shop drawings and  
30 special process procedures as welding, painting and structural bolting, shall be submitted for  
31 approval and shall be stamped by a registered professional engineer licensed to practice civil  
32 or structural engineering in the State of Idaho.  
33

34 Type: The metal building shall be a weather-tight, free-standing building having a structural  
35 steel frame. The building shall be a clear span rigid frame with pinned base parallel flange  
36 (straight) columns. The roof slope shall be at least 3:12, 3 in. per foot. Clear height shall be  
37 as shown on the drawings.  
38  
39  
40  
41  
42  
43  
44

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1    DESIGN LOADS:

2  
3    The building shall be designed for the following applied loads in addition to dead load:

4  
5    Vertical Live Loads: Roof covering shall be designed for either 50 psf uniformly distributed  
6    or a 200-lb concentrated load (over a 1 x 1-ft area) located at center of maximum roofing  
7    span.

8  
9    Snow Loads: All building components (other than the roof covering) shall be designed for a  
10   30 psf snow load (Importance Factor of 1.2), with an allowance for ice buildup at the eaves.

11  
12   Wind Loads: The wind load on the structure shall be designed for an 80 mph wind speed,  
13   calculated according to the exposure Class "C" and Importance Factor of 1.15.

14  
15   Seismic Loads: Seismic loads shall be determined and applied in accordance with the UBC  
16   Zone 2b and Importance Factor of 1.25.

17  
18   Fire Protection Loads: Coordinate fire protection static and dynamic loads (including  
19   seismic) imposed by sprinkler system and include such loads and method of attachment in  
20   design calculations to assure building structure is capable of supporting all loads.  
21   Subcontractor shall insure that the fire protection sub-tier provides the required information  
22   to the Metal Building Manufacturer.

23  
24   Collateral Loads: All additional dead loads, other than the weight of the metal building  
25   system, and the fire sprinklers such as, mechanical HVAC systems, electrical systems, and  
26   ceilings. Collateral loads shall be a minimum of 10 pounds per square foot as defined in the  
27   Metal Building Systems Manual published by the MBMA. Include additional loads for  
28   specific systems as referenced on the drawings, related specification sections, or below:

29  
30   Loads on metal building roof purlins from the HVAC stack (see drawing HV-2).

31        Vertical load = 2000 lbs

32        Horizontal load = 2000 lbs

33  
34   Loads on metal building columns from the HVAC stack (see drawing HV-2).

35        Horizontal load = 800 lbs (400 lbs per column @ 2 columns)

36  
37   Loads on metal building columns from the mezzanine area floor deck (see drawing S-6).

38        Vertical load = 36,000 lbs (18,000 lbs per column @ 2 columns)

39  
40   Maximum Deflection: Deflection shall be limited to L/240 for all building components.

41  
42   Lateral Deflection (Drift): Deflection shall be limited to H/240 for exterior walls.

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**MATERIALS:**

**Tubing or Pipe:** Conform to ASTM A 500, Grade B; ASTM A 501, or ASTM A 53.

**Members Fabricated by Cold Forming:** Conform to ASTM A 607, Grade 50.

### STRUCTURAL FRAMING COMPONENTS:

**End Wall Columns:** End walls shall be factory welded "T" shape or cold-formed "C" sections, and factory painted.

**Secondary Framing:** Purlins, eave girts, girts, flange and sag bracings shall be "Z" or "C" roll formed sections for fasteners, and shall be shop painted. Roof purlins shall be spaced a maximum of 5'-0" O.C. Base channel, sill angle, purlin spacers; minimum 14 gauge cold formed steel.

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1 Bolts: Bolts shall be ASTM A 325 in quantities necessary for design loads and connection  
2 details. Provide zinc- or cadmium-plated units when in direct contact with panels. Direct  
3 tension indicators shall be provided as specified in Section 05100, "Structural Steel and  
4 Miscellaneous Metals" of these specifications.

5

6 Fabrication: Shop fabricate to the indicated size and section, complete with base plates,  
7 bearing plates, and other plates as required for erection, welded in place, and with all required  
8 holes for anchoring or connections shop drilled or punched to template dimensions.

9

10 Shop connections shall be power riveted, bolted, or welded.

11

12 Field connections shall be bolted.

13

14 Shop Painting: Surfaces to be primed shall be cleaned of loose mill scale, rust, dirt, oil,  
15 grease, and other matter precluding paint bond. Follow procedures of SSPC-SP3 for power  
16 tool cleaning, SSPC-SP7 for brush-off blast cleaning, and SSPC-SP1 for solvent cleaning.  
17 Prime structural steel primary and secondary framing members with manufacturer's standard  
18 rust-inhibitive primer having over 50% rust-inhibitive pigment. No lead or chromate will be  
19 allowed.

20

21 Prime galvanized members, where provided, after phosphoric acid pretreatment, with zinc  
22 dust-zinc oxide primer.

23

24 ROOFING AND SIDING:

25

26 General: Provide roofing and siding sheets formed to general profile or configuration as  
27 specified. Provide flashings, closers, fillers, metal expansion joints, ridge covers, and other  
28 sheet metal accessories, factory formed of same material and finish as roofing and siding.

29

30 Roof Panels: The Interlocking-Standing Seam Roof Covering shall carry an Underwriters'  
31 Laboratories, Inc., Uplift Classification of not less than Class 90 and shall consist of material  
32 not less than 24 gauge flouropolymer enamel coated steel. The panels shall be installed with  
33 the ribs upstanding and parallel to the roof slope

34

35 All longitudinal interlocking ribs as well as any transverse end laps shall be properly sealed,  
36 according to the manufacturer's instructions, with non-drying sealant.

37

38 The roof panels shall be secured to each structural support by a steel clip concealed between  
39 the adjacent male and female ribs and fastened under that panel's weather surface. Clip shall  
40 be long enough to allow Styrofoam thermal spacer on top of purlin.

41

42 Penetrations through the roof panel by fasteners shall be limited to only those required at the  
43 rake eaves, at end laps and at the ridge. All exposed fasteners shall be fitted with weather-

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1 application. Building manufacturers standard curb and flashing system may be utilized if  
2 such a system is available.

3  
4 Ice Stops: Provide ice stops to prevent snow and ice damage to gutters. Ice stops shall be  
5 "ICEJAX" as manufactured by Snowjax Inc., Mechanicsburg, Pennsylvania, or approved  
6 equal. "ICEJAX" shall be adhered with Loctite "Depend", or approved equal, to metal roof  
7 panels.

#### 8 9 PIPE PENETRATIONS:

10  
11 For pipe penetrations through the roof use a "DEKTITE" pipe flashing unit as manufactured  
12 by ITW Buildex. Provide a stainless steel hose clamp for positive sealing of flashing to pipe.  
13 Building manufacturers standard pipe flashing system may be utilized if such a system is  
14 available.

#### 15 16 PART 3--EXECUTION

##### 17 18 ERECTION:

19  
20 Framing: Erect structural framing true to line, level and plumb, rigid and secure. Level base  
21 plates to a true even plane with full bearing to supporting structures.

22  
23 Bracing: Install diagonal rod or angle bracing in roof as required.

24  
25 Diagonal/rod bracing shall not interfere with ceiling purlins.

26  
27 Install portal frame bracing in sidewalls if required.

28  
29 Framed Openings: Provide shapes of proper design and size to reinforce opening and to carry  
30 loads and vibrations imposed, including equipment furnished under mechanical or electrical  
31 work. Securely attach to building structural frame. Reference drawings/specifications for  
32 specific items and their respective loads, as a minimum framed openings will be required at  
33 all overhead doors, personnel doors, and HVAC louvers. Supplemental framing shall be  
34 provided for the exhaust stack support.

##### 35 36 ROOFING AND SIDING:

37  
38 General: Install panels and associated items for neat and weathertight enclosure. Avoid  
39 "panel creep" or application not true to line. Protect factory finish from damage.

40  
41 Provide weather seal under ridge cap. Flash and seal roof panels at eave, swaged joints and  
42 rake with manufacturer's standard rubber, neoprene, or other closures to exclude weather.

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**Roof Sheets:** Roof sheets shall come with standard factory applied sealant along all lapped joints and between roof sheeting and accessories.

Where necessary, apply sealant tape continuous to clean, dry surface of weather side of fastenings and elsewhere to make weatherproof to driving rains.

**Wall Sheets:** Apply elastomeric sealant continuous between metal base channel (sill angle) and concrete foundation and elsewhere as necessary for waterproofing. Handle and apply sealant and back-up in accordance with sealant manufacturer's recommendations.

Align bottoms of wall panels. Fasten flashings, trim around openings, etc. with self-tapping screws.

**Sheet Metal Accessories:** Install louvers and other sheet metal accessories in accordance with manufacturer's recommendations for positive anchorage to building and weathertight mounting.

**Certification:** The Subcontractor shall submit a certified statement that all standing seam metal roofing, flashings, rain gutter and downspout, wall panels, fascia, structural framing and anchor bolts have been installed in strict accordance with the manufacturer's printed instructions and this specification.

### FIELD QUALITY CONTROL:

**Contractor Supplied Testing:**

**General:** The Contractor's Representative will inspect high-strength bolted connections and perform tests, visual inspection and prepare test reports unless noted otherwise.

**Shop Bolted Connections:** Inspect in accordance with AISC specifications.

**Shop Welding:** Inspect during fabrication of structural steel as required in Section 05060. Surveillance will be performed by the Contractor's Representative to verify compliance of the work to the drawings and specifications.

END OF SECTION 13120

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SECTION 13505--UNDERGROUND FIRE PROTECTION PIPING

PART 1--GENERAL

SUMMARY:

Section Includes: Work includes, but is not limited to:

Layout, fabricate, install, flush, and test a complete underground supply system including pipe, fittings, thrust blocks, rodded connections, supports, bracing, expansion joints, and all necessary accessories and components to assure a complete and operable system. Subcontractor shall be responsible for coordinating all existing and new work.

RELATED SECTIONS:

Section 02200 Earthwork  
Section 09900 Painting  
**Section 13910 Wet Pipe Fire Protection System**  
Section 13911 Dry Pipe Fire Protection System  
Section 13914 Water Spray Fire Extinguishing System

REFERENCES:

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO)

UBC Uniform Building Code

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 13 Standard for the Installation Sprinkler Systems  
NFPA 14 Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems

FACTORY MUTUAL (FM)

FM Approval Guide Fire Protection  
FM Data Sheet 3-10 Installation and Maintenance of Private Fire Service Mains and Their Appurtenances

UNDERWRITERS LABORATORIES INC. (UL)

UL Directory Fire Protection Equipment



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1 SYSTEM DESCRIPTION:  
2

3 Project Drawings: The project drawings do not attempt to show complete details of the site  
4 utilities which affect the fire protection installation. The drawings in part are diagrammatic  
5 and do not show all offsets, fittings, valves, equipment, etc. It is absolutely essential to study  
6 the architectural, structural, mechanical, and electrical drawings and confer with the various  
7 trades involved, to the end that there is no conflict between the fire protection system and the  
8 work of other trades and to assure that the owner secures the best arrangement of work  
9 consistent with the use of space.

10  
11 Layout Criteria: The underground fire protection piping shall be laid out and installed in  
12 accordance with the referenced codes and standards.  
13

14 Thrust Blocks: Thrust blocks shall be sized by a NICET Level III certified person or a  
15 professional engineer licensed in the State of Idaho. The soil shall be considered to have a  
16 maximum 3000 psi horizontal bearing strength. A minimum safety factor of 2 shall be used  
17 in thrust block calculations.  
18

19 Piping:  
20

21 Piping located beneath a building and up to approximately 5 feet away from the building  
22 must use Cement Lined Ductile Iron. All other installed piping maybe PVC.  
23

24 A pipe sleeve 4 inches in diameter larger than the pipe passing through the floor shall be  
25 installed around the system riser.  
26

27 A uni-flange shall be provide on the riser approximately 2" above the finished floor. The  
28 uni-flange shall be rodded to the elbow located beneath the floor. Rodding shall extend from  
29 the elbow to the first joint past the building foundation.  
30

31 Where cut in sleeves are used in this installation a spacer shall be installed in the sleeve and  
32 set screw retaining glands shall be used on each side of the sleeve.  
33

34 Depth of bury shall be as outlined in the referenced codes. However, in no case shall it be  
35 less than 6 ft. to the top of pipe. Any depth of bury less than 6 ft. will require pre-  
36 authorization by the Facility Fire Protection Engineer. The fire water pipeline shall be sized  
37 as shown on the drawing.  
38

39 Underground Pipe Identification: New underground pipelines shall be identified by use of a  
40 plastic.  
41

42 Fire Hydrants: Fire hydrants and valves are to be installed to proper finished grade.  
43 Hydrants shall be set so that the 2½" hose connections are 20 inches (plus or minus 2 inches)  
44 above finished grade level and to have the pumper connection pointing toward the road way  
45 for Fire Department access. Protective devices placed around the hydrant shall be located in

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a manner that will not interfere with connecting hoses too or flowing water from the hydrant ports.

The key valve for the hydrant shall be located such that connection of hoses to the 4½” pumper port will not hinder the operation of the valve.

Valving: Sectional and control valves installed on the underground fire main shall be equipped with electrical supervision. Electrical duct banks and/or conduit leading to the supervision device shall not be placed directly over the underground fire main.

**Pipe Identification:** Identification tape shall be spiral wrapped around the underground fire main.

### Cathodic Protection:

All metallic structures, (i.e. rodding, piping, and fittings, etc), installed as part of this project, shall have jumpers installed across them, if they are joining two metallic pieces. The jumpers shall be installed using Thermite Weld Connections to insure electrical continuity. Jumpers do not need to be provided across sections of plastic piping.

Underground ductile iron pipe, fittings, valves, hydrants, and metallic fasteners shall be wrapped or. Rodding shall be coated by the Subcontractor using an asphaltic material and then wrapped. Wrapping to be completed per manufacturer's instructions with a minimum of 50% overlap.

SUBMITTALS:

Vendor Data requirements for this section are summarized on the Vendor Data Schedule.

**Layout:** The fire water supply system layout shall be submitted as a complete package for review, with the bound package required as part of specification 13910. Complete packages shall include thrust block calculations, thrust block details, and piping method including make and model of all equipment used. Partial submittals will be considered as incomplete and will not be reviewed. The layout must receive an “A” or “B” designation by the Contractor prior to beginning of installation and shall comply with NFPA 13, FM 3-10, and FM Approval Guide requirements.

The Subcontractor shall submit all layout drawings for approval prior to construction. All drawings shall be completed on size D (22" X 34") CAD generated drawings. Lettering size shall be a minimum of 1/8 (.125)" inch for all lettering on the main body of the drawing. Border and title block shall follow format in this drawing package. Drawings shall be done using AutoCAD or a similar program which generates dwg files, which are compatible with AutoCAD 2000 and use a **simplex font**. An electronic copy of the As-Built configuration shall be furnished in addition to the original drawing plots.

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1 An electronic copy of border and title block format, as well as the associated drawings are  
2 available upon request. An A/E Drawing Standard format is available upon request.

3  
4 Thrust block calculation shall be submitted for information. These calculations shall show  
5 the formula used, overall size, and the individual side dimensions for the thrust blocks used  
6 in this installation. A detail shall be provided on the layout drawings that correlates to the  
7 dimensions provided by the calculations.

8  
9 Quality Control Submittals:

10  
11 Procedures: The Subcontractor shall submit a hydrostatic test procedure and a detailed,  
12 job specific flushing procedure. The flushing procedure shall outline where the  
13 flushing water will be obtained and how it will be disposed of in a safe manner. It shall  
14 also outline how the flow will be monitored to assure adequate flow and how long the  
15 flow must be maintained to adequately flush the piping. This procedure must be  
16 submitted for review prior to any connections to existing plant piping.

17  
18 Certifications: A Contractor's Material and Test Certification for Above-Ground  
19 Piping shall be completed and accepted, for each major portion of the work covered by  
20 this specification prior to final acceptance of the installation.

21  
22 See Section 01300, Submittals and the Vendor Data Schedule for additional submittal  
23 requirements.

24  
25 QUALITY CONTROL:

26  
27 Qualifications: The Subcontractor for the fire sprinkler system shall have a NICET Certified  
28 Engineering Technician (CET) in Fire Protection with a minimum Level III rating or a  
29 Professional Engineer (PE) in Fire Protection responsible for overseeing the preparation of  
30 the layout drawings and installation. This person shall be required to certify that the  
31 drawings are in accordance with this specification and all the regulatory requirements. All  
32 drawings shall be signed by the CET or stamped and signed by the PE.

33  
34 Manufacturers: Firms regularly engaged in the manufacture of fire sprinklers and piping  
35 accessories of types and sizes required, whose products have been in satisfactory use in  
36 similar service for not less than 5 years.

37  
38 Installer: A firm with at least 3 years of successful installation experience on projects with  
39 fire sprinkler piping similar to that required for this project. The installing Subcontractor  
40 shall be licensed, by the State of Idaho, as a Fire Protection Sprinkler Subcontractor.

41  
42 Materials: Provide piping, fittings, and devices with a UL listing and FM approval unless a  
43 specified product is only covered by one of the agencies. Exceptions will be made on a case  
44 by case basis for the products submitted as or equals. If no product exists that has both a UL

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listing and FM approval, it will be acceptable to use a product that has been published in either organization's publications.

Regulatory Requirements (Codes and Standards): Comply with the provisions of the following codes and standards unless otherwise specified herein.

NFPA 13

NFPA 14

FM Data Sheet 3-10

#### DELIVERY, STORAGE AND HANDLING:

All materials shall be delivered to and stored at the job site in a manner which will prevent foreign material from getting inside the piping and valves.

#### SEQUENCING /SCHEDULING:

The underground fire water main must be flushed and accepted prior to connection to the sprinkler system riser.

#### MATERIALS AND EQUIPMENT:

Ductile Iron Pipe: Underground fire water pipe and fittings shall be cement lined ductile iron pipe Special Thickness Class 50, mechanical or tyton joint, and conform to the mechanical properties of ANSI/AWWA C151/A21.51, UL Listed, cement lined per AWWA C104/A121.4. The piping shall be rated for a working pressure of 175 psi, 6 ft minimum depth coverage top of pipe, and truck load of AASHTO H-20 unpaved road, and 1.5 impact factor and calculations according to ANSI/AWWA C150/A21.50 and C150/A21.51. Pipe shall be U.S. Pipe, Models Tyton Joint and/or Mechanical Joint, or approved equal.

PVC Pipe: Underground fire water piping shall be Class 200 PVC meeting AWWA C900 requirements. Pipe shall be JM Pipe model Blue Brute Model Class 200, PW Pipe Model Twinseal Class 200 DR14, or approved equal. The piping shall be rated for a working pressure of 175 psi, 6 ft minimum depth coverage top of pipe, and truck load of AASHTO H-20 unpaved road, and 1.5 impact factor and calculations according to ANSI/AWWA C150/A21.50 and C150/A21.51.

Ductile Iron Fittings: Underground fittings shall be ductile iron mechanical or slip joint, and conform to the mechanical properties of ANSI/AWWA C151/A21.51, UL Listed, cement lined per AWWA C104/A121.4. The piping shall be rated for a working pressure of 175 psi, 6 ft minimum depth coverage top of pipe, and truck load of AASHTO H-20 unpaved road, and 1.5 impact factor and calculations according to ANSI/AWWA C150/A21.50 and C150/A21.51. Fittings shall be U.S. Pipe, Models Tyton Joint and/or Mechanical Joint or approved equal.

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1 Rodding: Studs or threaded rod shall conform ASTM A 307 Grade B and use nuts that  
2 conform with ASTM A 563 Grade A, heavy hex. Washers shall be steel or ASTM A 126  
3 class A cast iron, round or square as required. Rod couplings or turnbuckles shall be ASTM  
4 A 197 malleable iron.

5  
6 Exothermic Welds: Electrical connection of copper wire to steel fittings and pipe shall be by  
7 the Thermite weld method. Thermite weld materials shall consist of wire sleeves, welders,  
8 and weld cartridges according to the weld manufacturer's recommendations for each wire and  
9 pipe size and material. Maximum cartridge size shall be 25 gram for steel materials and 32  
10 grams for ductile and cast iron materials.

11  
12 Adapter sleeves for No. 4 shall be installed as recommended by the thermite weld  
13 manufacturer. Sleeves shall be attached with appropriate sized and type of hammer die and  
14 method as recommended by the thermite weld manufacturer.

15  
16 Thermite weld materials are available as specified from Erico Products Inc., Cleveland, Ohio,  
17 Continental Industries, Inc. Tulsa, Oklahoma, or approved equal.

18  
19 Thermite Weld Caps: Thermite weld caps shall consist of a 4" x 4" size pre made weld cap  
20 filled with elastomeric mastic coating and suitable primer, such as the Handy Cap II with  
21 Royston 747 Primer, available from Royston Laboratories, Inc. or approved equal.

22  
23 Post Indicating Valve (PIV): PIV's shall consist of a UL listed and FM approved, resilient  
24 wedge gate valve and indicator post from the same manufacture. The valve shall be  
25 mechanical joint or flanged. The PIV shall be a Clow Model F-6106, Waterous Series 500,  
26 or approved equal.

27  
28 Fire Hydrants: Hydrants shall be dry barrel with a with a 5¼ in. minimum main valve  
29 opening, rated for a working pressure of 175 psig, open counterclockwise and have two 2½  
30 in. hose connections and one 4½ in. pumper connection. Hose connections shall be National  
31 Standard fire hose threads.

32  
33 Hydrants shall have drain holes and mechanical joint (MJ), flanged, or TYTON connections,  
34 allow for servicing from above ground and be equipped with a traffic safety flange to allow  
35 for a clean break when the hydrant is hit.

36  
37 Hydrants shall be a Clow Medallion, Model No. F-2545, Waterous model WB-67UF, or  
38 approved equal. If an approved equal hydrant is used, repair tools for the hydrant shall be  
39 provided.

40  
41 Key Valve with Road Box: Key valves shall be resilient wedge gate valve, Clow Model F-  
42 6106, Waterous Series 500, or approved equal. The valves shall have mechanical joint,  
43 flanged, or other approved ends. Provide 4" cast ductile iron valve stand pipe, road box and  
44 key valve wrench.

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Valve Tamper Switch: Switch shall have two sets of S.P.D.T. contacts, use Potter Model PCVS or approved equal.

Set Screw Retaining Gland: Provide set screw retaining gland and associated screws. Use Megalug 1100 Series for ductile iron pipe or Series 2000PV for PVC pipe or approved equal.

Wrapping: Polyken 920, 20-mil wrap or approved.

Uni-Flange: Ductile iron adapter flange, Tyler/Union Pipe or approved equal.

Set Screw Retaining Gland: This gland is to be UL or FM approved. Use Megalug or approved equal.

Underground Pipe Identification: New underground pipelines shall be identified by use of a plastic ribbon no less than 3 in. in width with a message printed on the ribbon which identifies the actual pipeline contents. The plastic ribbon shall be color coded in conformance with the following:

<u>Categories of Pipeline Contents</u>	<u>Tape</u>	<u>Lettering</u>
Fire Water	Red	White

### PART 3--EXECUTION

#### INSTALLATION:

Materials: Only new and approved pipe, fittings, and devices shall be employed in the installation of the underground system.

Thrust blocks: Forms shall be used in the placement of the thrust blocks. If the thrust blocks can not be placed against undisturbed soil it will be permissible to compact the soil behind the thrust block to a minimum of 90% proctor.

Thermite Weld Wire Connections: Electrical connection of copper wire to metallic surfaces shall be by the thermite weld method where it is safe to do so. In the event conditions at the negative connection site preclude thermite welding, an above ground connection may be made with a pipe clamp.

The area where the connection is to be made shall be cleaned to bare metal by making a 2" square window in the coating, and then filing or grinding the surface to produce a bright metal surface. Wire sleeves shall be used on wire size as recommended by the manufacturer. The proper mold for pipe size and wire shall be used as recommended by the manufacturer. The mold and base metal shall be clean and dry.

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1 After the weld connection has cooled, remove slag, visually and physically test the quality of  
2 the connection by tapping with a hammer. The weld should present a well formed appearance  
3 with minimal loss of weld material.

4  
5 Clean the completed thermite weld connection area with a wire brush. Prime and-install a  
6 prefabricated weld cap over each connection. Other welded underground wire to pipe  
7 connections shall be cleaned and coating repaired in the same manner.

8  
9 Pipe Wrap: Wrapping shall be installed following the manufacture's recommendations and  
10 using a 50% overlap.

11  
12 Underground Pipe Identification: Ribbon shall be spiral wrapped around the pipeline at no  
13 less than 1 wrap per 3 ft. of run.

14  
15 FIELD QUALITY CONTROL:

16  
17 One set of approved installation shop drawings shall be maintained on the project site during  
18 construction. The Subcontractor shall redline all changes daily. The redline drawings shall  
19 be incorporated on the "as-built" design drawings by the Subcontractor.

20  
21 Acceptance Tests:

22  
23 Thermite Weld Wire Connections: After the weld connection has cooled, remove slag,  
24 visually and physically test the quality of the connection by tapping with a hammer. The weld  
25 should present a well formed appearance with minimal loss of weld material.

26  
27 Flushing of Piping: New underground mains and lead-in connections to system risers shall be  
28 flushed thoroughly immediately after tie-in to system is made or before connection is made to  
29 the sprinkler piping.

30 Flush underground mains through hydrants at dead ends of the system or through accessible  
31 aboveground flushing outlets allowing the water to run until clear and move any foreign  
32 material out of the piping.

33  
34 If water is supplied from more than one source or from a looped system, divisional valves  
35 shall be closed to produce a high velocity flow through each single line.

36  
37 A flow of 880 gpm (6 inch line), 1560 gpm (8" line), 2440 gpm (10 inch line), or 3520 gpm  
38 through a 12 inch line will produce a velocity of at least 10 ft/sec (3.0 m/sec), which is  
39 necessary, for cleaning the pipe and for lifting foreign material to an above-ground flushing  
40 outlet.

41  
42 Test of Piping System: All new underground Fire System piping shall be hydrostatically  
43 tested at not less than 225 psi (11380 kPa, 13.8 bar) pressure for two hours.

- 44  
45 1. Slowly fill with water each section of the main to be tested.

2. Expel all air by opening hydrants at the highpoints of the system and at both ends, or by bleeding air through the sprinkler drains.
3. Open wide the valve controlling the admission of water before shutting the hydrants or drains.
4. After the system has been filled with water and the entrapped air expelled, close the valve controlling the section being tested and begin applying pressure.
5. Increase the water pressure in 50 psi (345 kPa, 3.5 bar) increments until the specified test pressure is attained.
6. After each increase in pressure, make observations of the stability of the joints. In these observations, include such items as protrusion or extrusion of the gasket, leakage or other factors likely to affect the continued use of a pipe in service.
7. During the test increase the pressure to the next increment only after the joint has been determined to be stable. This applies particularly to movement of the gasket.
8. After the pressure has been increased to the required maximum value and held for one hour.
9. **Decrease the pressure** to 0 psi (0 kPa, 0 bar) while observing for leakage. Then slowly increase the pressure to the specified maximum and hold the pressure for one more hour.

**Warning:** Do not use the fire pumps to supply pressure. A pipeline break during testing could result in damage from the large flow of escaping water. Instead, use a small hydrostatic test pump.

#### Test for Dry-Barrel Hydrants:

1. Following the hydrostatic pressure test, close the hydrant main valve.
2. Remove one outlet-nozzle cap and place the palm of one hand over the outlet-nozzle opening.
3. Drainage should be sufficiently rapid to create a noticeable suction.
4. If the hydrant fails the drainage test, partially open the hydrant with the outlet-nozzle caps on to create a pressure that will clear the drain valve. If this fails, then the drain valve assembly should be removed and inspected. If the drain valve is clear, then the problem may be that the drain outlet is plugged from outside the hydrant. Repair will require digging down around the outside of the hydrant and clearing the drain outlet.

Testing and flushing shall be witnessed by the Contractor's Representative.

Holiday testing shall be completed for wrapped pipe, fittings, rodding, and valves per NACE standard RP-02-74. Subcontractor shall repair all defects. The Contractor's Representative shall witness the test.



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1

2 END OF SECTION 13505